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REQUIREMENT OF BREVET OF INVENTION

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74	Mandatory	
75	Element Filter	
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33 32 31	Priority Convention	

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Disposition which become object in this invention is element filter which is able to use as air filter, oil or fuel filter that used in automotive vehicle or the similar. The particularly are reality of presence maximal utilization, at surface, from filter material, which give perfect impermeable, and able to apply at many shape and filter disposition, and economic construction.

Until now, it has known cylindrical filter has element filter that places in cylinder chamber. Both of extremities of element filter are consist of two flanges that made from plastic elastic material. The inconvenience is flange has low plasticity, caused element filter get significant pressure at longitudinal direction, during alignment to get waterproof.

Disposition which become object in this invention is to eliminate above inconvenience and bring some advantages like described before and will be better to understand with attached figure description which show non limitative some realization of invention.

We see

Figure 1, schematic view of slicing of longitudinal parts and the slice is fold to bellow, according I-I that showing air filter with element filter, completed by first shape of impermeable flange.

Figure 2, schematic view of slicing of longitudinal parts that showing air filter with element filter, completed by second shape of impermeable flange

Figure 3, perspective view of element filter that made according first realization of invention, which able to be adapted to high filter cylinder.

Figure 4, schematic view of slicing of longitudinal parts of air filter with element filter meet to first realization of invention.

Figure 5, perspective view of same element filter, which able to be adapted to cone shape filter.

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Figure 6, perspective view of same element filter, which able to be adapted to transversal filter with irregular shape.

Figure 7, perspective view of element air filter that made according to first realization of invention, which able to be adapted to low filter cylinder.

Figure 8, perspective view of same air filter, which adapted to cone filter

Figure 9, perspective view of element air filter at figure 7 that adapted to prismatic filter which transversal side has irregular shape

Figure 10, perspective view of element air filter it self which have flat shape, according to second realization of this invention.

Figure 11, schematic view longitudinal slicing of an air filter which use element filter with additional pre-filter sound shock absorber meet to fifth realization of invention.

Figure 12, perspective view of element air filter that made with pre-filter meet to third realization of invention.

Figure 13, perspective view of element air filter that made with pre-filter meet to fourth realization of invention.

Filter body 2 shown at figure 1, included a cylindrical perforated cover 3, air flow into hole of perforated cover to be strained, the both extremity of perforated cover is closed by two panel 4 which one of panel put in hose 5 as outlet of strained air to 11. At Filter that has already known, the body of filter consist of element filter 6 usually is made by pleated filter media such as paper, cloth or porous plastic material like a filter. others material which can use naturally or dip to resin synthetic. Slicing which fold to bellow according I-I is shown pleated filter media which has purpose to maximize surface area and also round to filter longitudinal axis, to make hollow.

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At both extremities 7 of hollow cylinder are mould two flange 8 with poly-chloro vinyl material or same plastic and elastic material. Flange 8 is completed by circular lip 9 that will touch to 10 interior parts of panel 4, which will push air circulation to direction 11 into media filter, to avoid at 12.

Flange 8 is able to mould from polyurethane material or plastic material has analog compressibility (fig. 2). At interior of panel 4, support to each presence of

compressions of circular 'bossage' with 'boudin' shape 13 is on 10, to make that place waterproof.

Filter has such method to realize is expensive output of industry, because must use machine and mould to make flange 8 and to place at pleated material 6. And also flange 8 which is made as above procedure has a low compressibility, therefore all the filter body 2 need to has precise length dimension, that must be effort axial of compression to element filter, to place in filter body.

New invention of element filter is to avoid inconvenience. In first realization, element filter (fig. 3) including pleated filter media, dipping paper or not to resin synthetic, cloth or equivalent porous plastic material 6, arrange and rounded to make hollow like figure 1, the extremities of pleated material are bind each other or simple arrange two pleated which one pleated is inserted to other pleated. After obtain hollow, then be placed upper end surface and lower end surface (fig. 3 and 4). Two flanges 16 and 17 are cut from soft sponge sheet from material porous polyurethane or plastic material with analog compressibility and bind to one of surface.

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Utilize glue that compatible with present material is utilize volatile solvent. After a few minute parts has smeared glue is contacted and given less pressure then will get perfect bind with perfect waterproof between extremities cylinder pleated 14 and 15 with both of flange 16 and 17. After got element filter 18 with composition as describe can put in filter body 19 (Fig. 4) analogous with figure 1. Clearly that bellow effort axial 20 is weak, flange 16-17 easily to compress caused by using soft porous material. Thickness that compressed can reach one sixth of initial thickness. So no more need to give high effort axial 20 to element filter 18 or respective tight tolerance of length of body filter 19 such as realization of fig. 1 and 2.

The other advantages which give efficiency to height of element filter is correlation with total length of element filter 21 (fig. 4), length 22 of pleated filter media has been maximal, because we have seen which thick 23 at flange 16 and 17 is very weak and particularly softer than longitudinal pile 24 (Fig. 1 and 2) of mould flange has been known.

Perfect waterproof below flange axial pressure which be used in this invention counter inside part of panel that closed extremity of cylinder body 19 assure high certainly of functional. Flexibility of flange bind to pleated filter is radial extended 25 (fig. 5), resulted cone shape element filter in filter body. The edge or 'bossage' are arranged in panel of filter body that got flange 16 and 17, maintain flange at usage diameter.

Flexibility flange 16 and 17 is permit to make irregular shape (fig. 6) by keep position and shape according to panel of filter body. This change shape condition can only happen with flange of this new invention. And it is impossible to happen by flange has known at fig 1 and 2.

Others shape of first realization of invention, diameter 26 hollow cylinder that get from pleated filter media is bigger than first case which described, but reverse, height 27 is shorter (fig. 7). This element filter can use in short filter body with dimensionally fit, also (fig. 8) use in cone shape filter body, or use (fig. 9) in prismatic filter body with any kinds of successive sections. But the particular of realization of low shape is all element filter can rotate in direction 28 (Fig. 7 and 8). That is the purpose of second realization of invention. Element filter take disc shape represented figure 10. Flat flange 17 takes shape cylinder 29. Flat flange 16 takes shape cylinder 30 and pleated filter body 18 present non directional of pleated / more directed to generally cylinder (figure 7) or cone (figure 8) or prismatic with any kinds of successive section (figure 9), but obey radii (figure 10) which placed at same surface or obey generally a very open cone.

In this new disposition, element filter can dispose of 31 (fig. 11) an interior of filter body 32 is closed by cover 33. Fluid 34 will be strained will flow through element filter 31 in direction 35 to flow out to 36 or reverse. Interior diameter 32-1 of body filter 32 is set until smallest outer dimension of cylinder flange 29. Installation of element filter 31 in body filter 32 will make compression at cylinder flange 29 toward radial 37. Also outer diameter 32-2 of air outlet pipe 32-3 is set until largest dimension of inside diameter of cylinder flange 30, installation also will make radial compression to this flange. Both flanges 29 and 30 compression will assure waterproof of filter.

It is possible to use only one disc element filter or to pile some disc element filter.

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It is possible to increase element filter performance of such dust up. In third realization of invention (fig. 12) dispose a tube 39 at outer of cylinder that shaped by element filter 18 of previous realization. Tube 39 is obtained by cutting, rolling, gluing or soldering of porous polyurethane tape, plastic material with analog porosity. It will obtain increasing weight of strained dust during fluid flow through direction 40. Tube cover from polyurethane material is only used during at "pre-filter" and internal element 18 (pleated paper or analog material) is as "finisher" and complete weight of strained dust.

It is bale to increase all this filtered performance by oiling and pressing tube 39. Moreover possibility to separate tube 39 and pleated filter 18 acts as "finisher", give allowance to clean both of parts.

In fourth realization of invention, polyurethane tube 39 (fig. 13) is placed inside element filter 18. This disposition is used to strain fluid that circulate at direction 41.

It is possible to combine third realization and fourth realization by placed tube 39 at outer and inside element filter, to increase performance of such dust up.

In fifth realization of invention, in case element filter has disc shape (fig. 10) and acts as element "finisher", element pre-filter is able to shape with porous polyurethane disc or plastic material with analog porosity, to be cut flat crown shape and put on filter body 42 (fig. 11) at side inlet of strained fluid. The function is same like in third and fourth realization before.

Performance of "pre-filter" is also able to increased by oiling and pressing. Thus like in third realization and fourth realization, whole cleaning is easy thing by separate "pre-filter" and "finisher". It is possible to palace disc on each side of element filter to improve performance of such dust up.

Utilization of tube 39 or disc 42 is give more allowance to damp voice noise intensity, especially voice noise at internal combustion engine, by the way to resist spread from inside filter which connected to engine inlet pipe, until outside filter that placed inside engine cap.

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Present brevet is free for whole disposition of device that differentiates element-element filter only by general shape of sheet, like by pleat filter media, by make comparative dimension, by material is used, although have already followed data construction and assembly of filter device that have described.

Present brevet is also applicable at whole usage of element filter for any kind fluid, except automotive application or analog, for whole device at it function must use filter.

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Claim

1. Element filter utilizable at air filters, oil filters or fuel filters, or general fluid filters, is used at automobile or analog, or used at whole equipment functionally need a filter, characterized by the element filter show maximal utilization at filter media, also show perfect impermeable, possible to adapted at some form and filter disposition, and has economic construction.
2. Element filter in accordance with claim 1 which characterized by consist of pleated filter media, dipping paper or not to resin synthetic, cloth or equivalent porous plastic material; rolled to form hollow, both extremities which rolled gluing each other or only bind by two folded that one folded on other folded. The hollow gluing ant upper end and lower end.
3. Element filter in accordance with claim 2 which characterized by consist of two pieces flange that cut from porous very soft polyurethane sponge, or plastic material with analog compressibility, flange is also stick on one of

the surface. Glue which be used must compatible with present material, and utilize volatile solvent.

4. Element filter in accordance with claim 3 which characterized by a few minute after sticking, pleated material and flange are contacted under low pressure so we get perfect adhesion with absolute impermeable between the both of extremities of pleated hollow and both of flange, that this realize result a element filter without through procedure of mould which very expensive.
5. Element filter in accordance with claim 4 which characterized by element filter can be installed to cylindrical filter body and soft effort axial which done during places give possibility easily to press flange until one sixth of initial thickness which cause using porous soft material as flange, that exclude limit tolerance along filter body.
6. Element filter in accordance with claim 5 which characterized by high flange compression correlation with length of pleated filter and total length of element filter has maximal value, which give a maximal surface area of filter media for certain length of element filter.
7. Element filter in accordance with claim 6 which characterized by best impermeable under soft axial pressure which done by flange of element filter to interior of panel which closed the extremities cylindrical body filter.
8. Element filter in accordance with claim 7 which characterized by high flexibility of flange which stick to pleated media that give possibility to increase flange radial length, that authorize utilization the element filter in cone shape or prismatic shape with any successive section, edge with boughs or "bossages" which arrange in filter body panel which filter flange is installed that maintain position and shape of element filter.
9. Element filter in accordance with claim 8 which characterized by long diameter and low height, also possibility pivot round movement, to make disc shape with cylinder flange and pleated paper of body filter in regular or irregular direction, followed generally cylinder or cone or prismatic with any successive section, followed radii at same surface or met to generally open cone.
10. Element filter in accordance with claim 9 which characterized by realization to install inside filter body, one or more, in pile arranged. element filter give impermeability as result of filter body dimension at internal surface compress outer surface flange and inner surface flange of element filter.
11. Element filter in accordance with claim 8 which characterized by realization to increase collecting dust of filter element with placed inside or outside hollow cylinder to make cover in strained fluid movement direction to hollow cylinder that get by cutting, rolling, gluing, soldering

some connecting porous polyurethane or plastic material with analog porosity, cover act as "pre-filter" and pleated element act as "finisher". "pre-filter" is able to increase performance by oiling and pressing. Whole cleaning is become easy by facility to separate "pre-filter" and "finisher"

12. Element filter in accordance with claim 10 which characterized by realization to increase efficiency of disc element filter which act as "finisher" by arranged a "pre-filter" from porous polyurethane sheet or plastic material with analog porosity, that cut to make crown plate and placed on filter body at direction of incoming strained fluid flow. "Pre-filter" is able to increase performance by oiling and pressing. Whole cleaning is become easy by facility to separate "pre-filter" and "finisher". Also possible to placed a plate on each side of filter to increase performance of collecting dust.
13. Element filter in accordance with whole claim 11 and 12 which characterized by realization of "pre-filter" cover also act as voice damper especially damper voice of internal combustion engine, by the way to resist voice spread from inside filter which connected at inlet metal tubes of engine to outlet which placed inside cap engine.

Planche I/4

Fig. 1

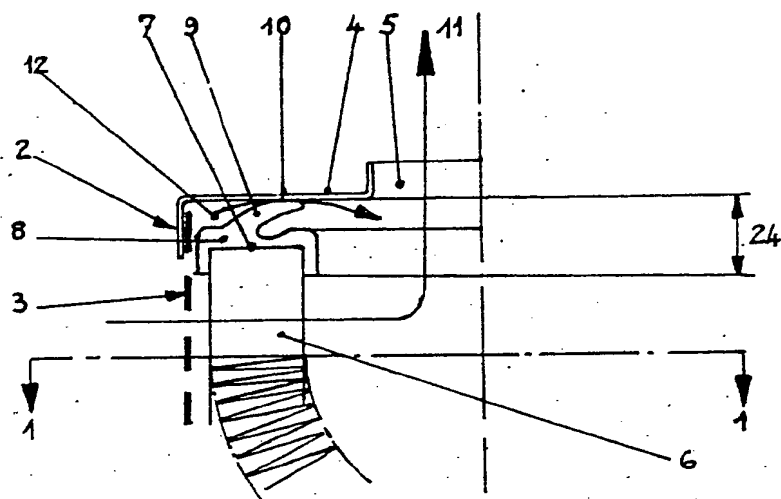


Fig. 2

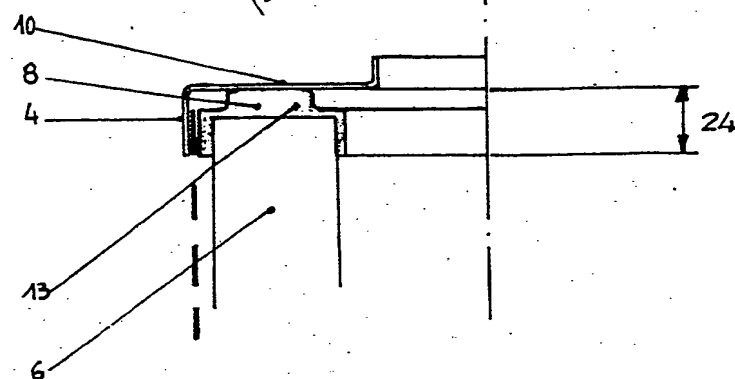
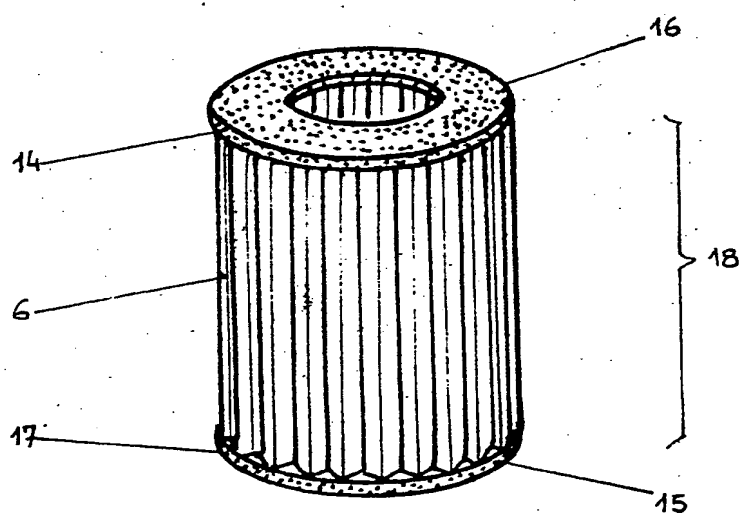


Fig. 3



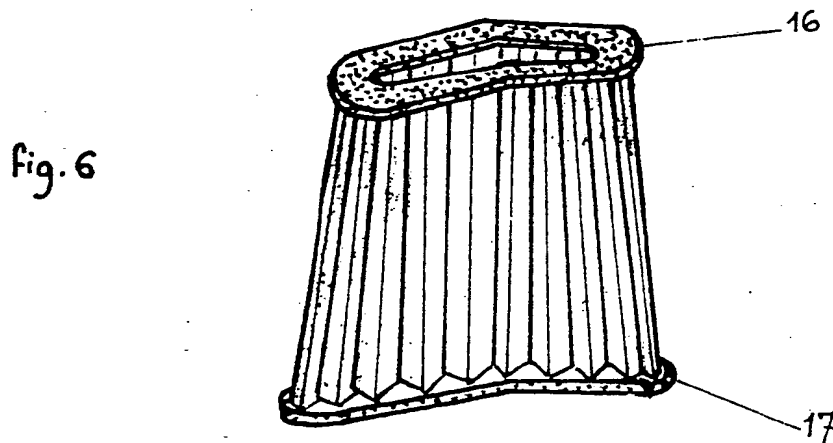
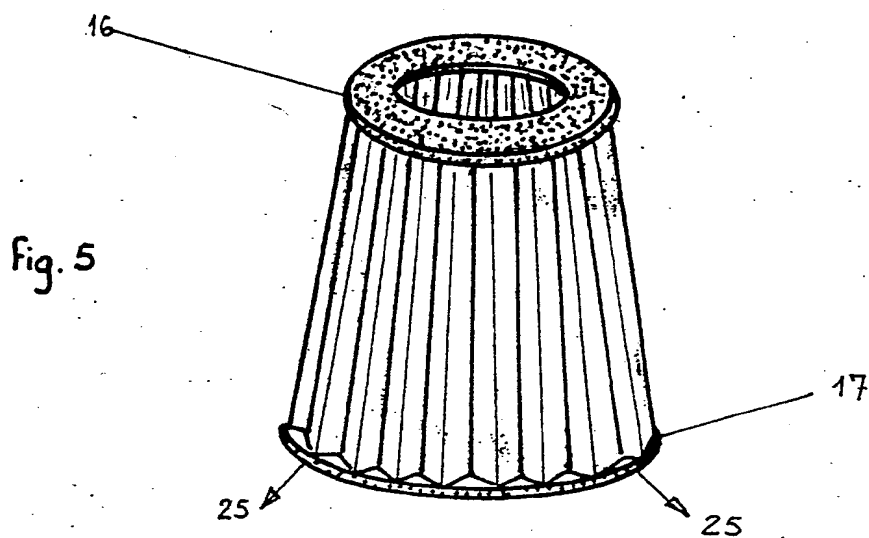
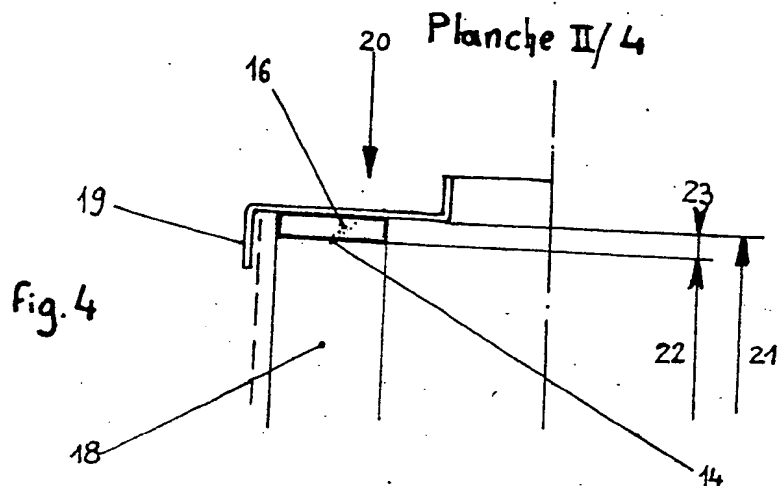


Planche III/4

fig. 7

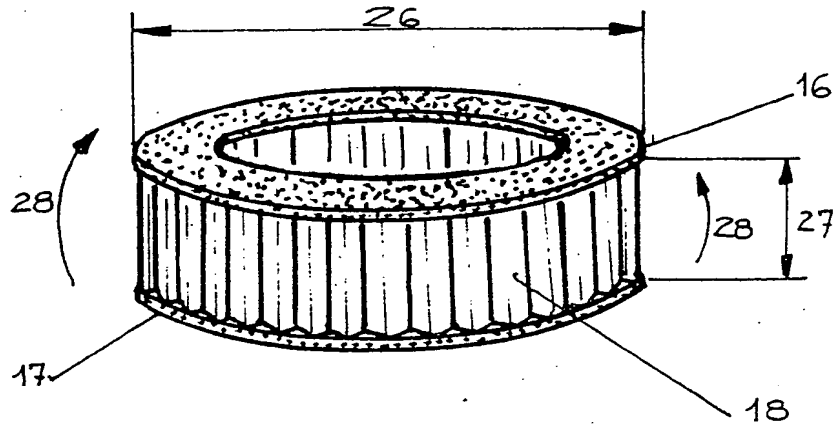


fig. 8

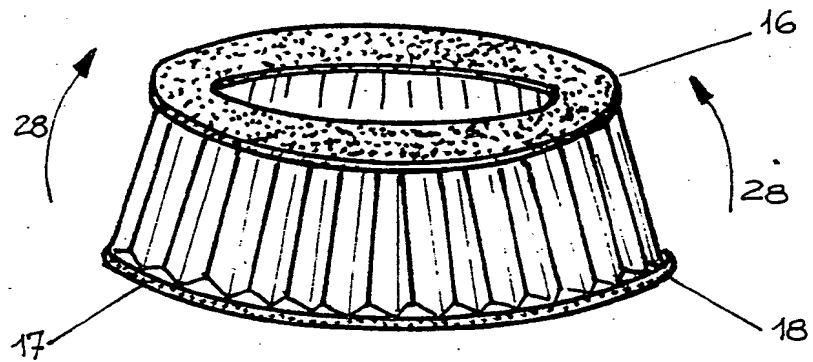


fig. 9

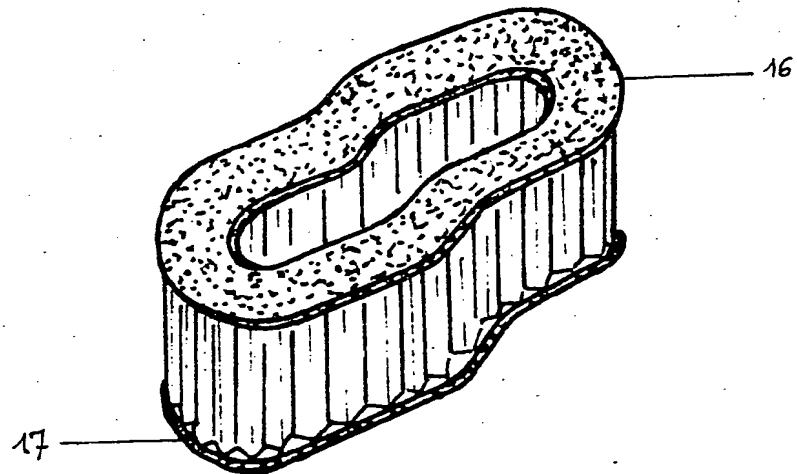


Fig. 10

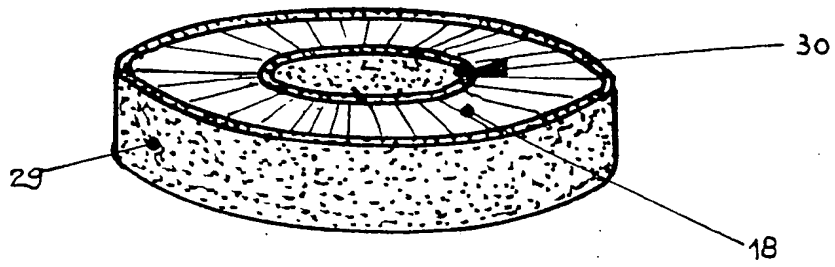


Fig. 11

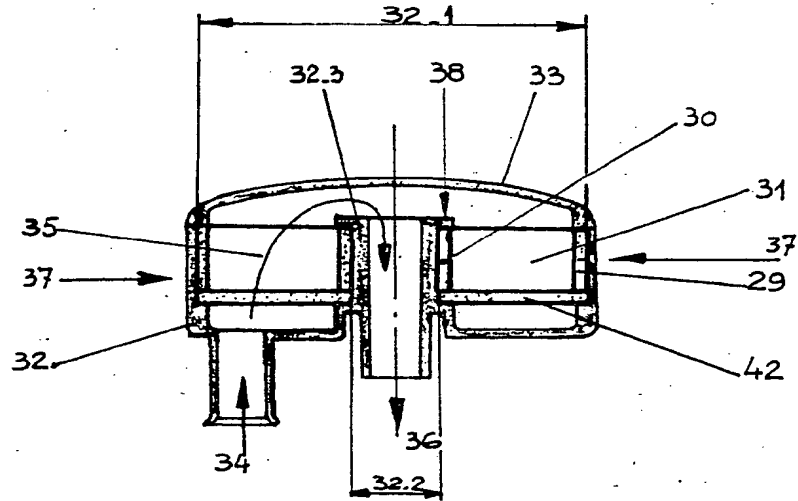


Fig. 12

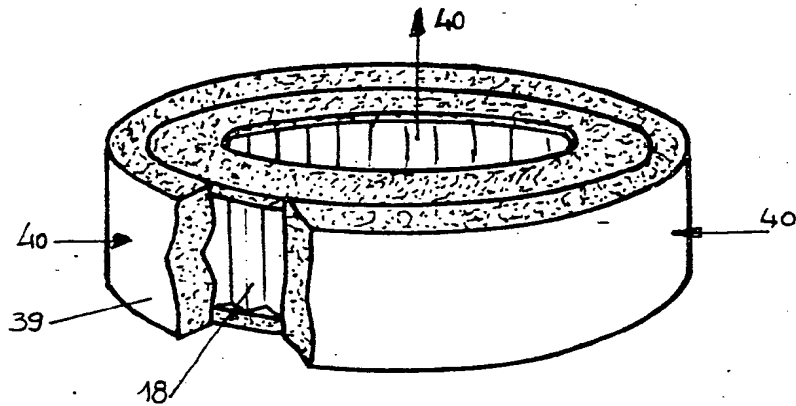


Fig. 13

